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Report to the Chairman, Subcommittee  
on Military Readiness, Committee on  
Armed Services, House of  
Representatives

June 1999

MILITARY  
READINESS

Readiness Reports Do  
Not Provide a Clear  
Assessment of Army  
Equipment



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National Security and  
International Affairs Division

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June 16, 1999

The Honorable Herbert H. Bateman  
Chairman, Subcommittee on Military Readiness  
Committee on Armed Services  
House of Representatives

Dear Mr. Chairman:

On the basis of your concerns about the combat readiness of U.S. military forces as the individual services deal with reductions in force size and the expanding demands of peacekeeping and humanitarian assistance operations, we reviewed the equipment readiness in active duty Army units. As requested, this report addresses whether active duty units (1) have the equipment required to conduct their wartime missions, (2) are keeping their equipment in good condition, and (3) can sustain the equipment in a two major theater war as required by the National Military Strategy.

## Results in Brief

While details are classified, a high percentage of active duty Army units have the major equipment items they need for their wartime mission. Moreover, Army information shows that units are maintaining the bulk of their equipment in a fully mission capable condition. Despite these positive indications of readiness, current readiness reporting systems are not comprehensive enough to reveal all readiness weaknesses. For example, they do not show operational limitations that have been caused by extensive shortages of support equipment essential to effective, sustained use of major equipment items. Units could deploy without this equipment and could perform their basic combat missions, but they would be limited in their capability, flexibility, or sustainability. Additionally, the Army has stated that its equipment is aging and becoming increasingly difficult to maintain and maintenance managers at units we visited told us that their mechanics are devoting increasing amounts of time to keep equipment operating. These problems are not reflected in readiness data, which show units are able to keep their equipment serviceable. We have reported that serviceability rates do not provide a good assessment of equipment condition because equipment that is old, unreliable, and difficult to maintain may still be reported serviceable. While maintenance problems may exist, the Army does not have data that clearly shows either what its equipment problems are or how units are affected.

Two factors suggest that the Army could have difficulty sustaining equipment in the event of two nearly simultaneous military operations. First, there is a significant shortage of maintenance personnel with the right skills and tenure. As a result, unit maintenance personnel are working longer and harder to keep equipment in a fully mission capable condition. Second, Army officials are concerned that shortages of war reserve repair parts could seriously affect the operational availability of many of the Army's primary weapon systems. Army officials report they have started efforts to fund critical shortages.

We are making recommendations intended to improve the reporting of (1) auxiliary equipment shortages in Unit Status Reports and (2) equipment condition in congressional readiness reports.

## Background

The Army's system for reporting the current status of Army units to the National Command Authority, the Office of the Joint Chiefs of Staff, and Headquarters, Department of the Army, is the Unit Status Reporting System. Each month, or more frequently when changes occur, over 1,400 active duty Army units provide information on their status in four measured resource areas: personnel, equipment on hand, equipment serviceability, and training. A unit's overall status is measured by a "C" rating, which ranges from C-1 (best) to C-5 (worst). Units also provide narrative remarks to support and clarify data. The Unit Status Report data feed into the Department of Defense's (DOD) system for reporting readiness to the Joint Chiefs of Staff, the Status of Resources and Training System (SORTS).

Equipment readiness is indicated in two Unit Status Report resource areas; equipment on hand status and equipment serviceability status. Equipment on hand indicates whether units have their principal weapon systems and major equipment items compared to their wartime requirements. Principal weapon systems and equipment are identified in a unit's Table of Organization and Equipment<sup>1</sup> by an equipment readiness code of P or A. Items coded P are central to an organization's ability to perform its doctrinal mission and are known as pacing items (e.g., tanks in a tank battalion). The majority of units have two pacing items, and at most a unit would have four pacing items. In total, the Army has categorized about

<sup>1</sup>A Table of Organization and Equipment prescribes the normal mission, organizational structure, and personnel and equipment requirements for a tactical military unit.

120 separate weapon systems and equipment items as pacing items. A unit's equipment inventory on-hand status is reflected in an S-level that ranges from S-1 (best—having most or all its equipment) to S-4 (worst—missing significant amounts of equipment).

Units also report how much auxiliary equipment they have compared to their wartime requirement, but this information is not considered in determining a unit's equipment on-hand status. Auxiliary equipment is essential to support principal weapon systems and provide mission sustainment support.<sup>2</sup> It includes items or systems required for transporting, maintaining, supplying, servicing, protecting, enhancing, or backing up principal weapon systems, such as unit maintenance equipment; nuclear, biological, and chemical defense equipment; support vehicles; mess equipment; and camouflage nets. Units identify the number of auxiliary equipment items in their Table of Organization and Equipment and determine a status rating for each item in accordance with Army Regulation 220-1. For example, a unit reports a status rating of S-1 if it has 90 percent or more of its requirement for a specific auxiliary equipment item; S-2 if it has 80-89 percent of its requirement; S-3 if it has 65-79 percent of its requirement; and S-4 if it has less than 65 percent of its requirement. The unit then identifies the number of equipment items at each S-level in the Unit Status Report remarks. To illustrate, if a unit is required to have six radios, six sets of night vision goggles, and six aircraft tool kits and has five radios, five sets of night vision goggles, and four tool kits on-hand, it would be S-2 for radios ( $5/6=83$  percent), S-2 for night vision goggles ( $5/6=83$  percent), and S-3 for tool kits ( $4/6=67$  percent). In its Unit Status Report, the unit would report that two equipment items are at S-2 and one equipment item is at S-3. It would not report the specific types or amounts of equipment missing. However, the commander is expected to narratively report any mission limitation that is caused by shortages of auxiliary equipment in the remarks section of the Unit Status Report and reflect this limitation in his mission accomplishment estimate. The mission accomplishment estimate is the commander's subjective assessment of the unit's ability to execute that portion of the wartime mission it would be expected to perform if alerted or committed within 72 hours of the date of the report.<sup>3</sup>

<sup>2</sup>The term auxiliary equipment as used in this report includes both auxiliary and auxiliary support equipment.

<sup>3</sup>See Army Regulation 220-1, Sept. 1, 1997, ch. 8.

Equipment serviceability indicates how well units are maintaining their on-hand reportable equipment. On-hand reportable equipment consists of the unit's pacing items and any other equipment systems or individual items controlled by materiel condition status reports. In total, about 570 equipment systems and items are controlled by materiel condition status reports (comprising about 8 percent of the total equipment in the Army's inventory).<sup>4</sup> The serviceability rate is a percentage based on the number of days reportable equipment is available to the organization and fully able to do its mission compared to the number of days it could have been available. A rate is calculated for (1) each pacing item and (2) all pacing items and reportable equipment in aggregate. A unit's overall status is the lower of the two serviceability rates. Pacing items again receive special emphasis because of their major importance to a unit. The unit's equipment serviceability status is reflected in an R-level that ranges from R-1 (best—equipment other than aircraft are fully mission capable and available to the unit 90 percent or more of the days in the period or aircraft are fully mission capable 75 percent or more of the days in the period) to R-4 (worst—equipment other than aircraft are fully mission capable less than 60 percent of the days in the period, or aircraft are fully mission capable less than 50 percent of the days in the period).<sup>5</sup>

In its fourth quarter, fiscal year 1998 Quarterly Readiness Report to the Congress, DOD also reported on a number of other equipment condition indicators. These indicators include (1) the percentage of equipment reported out of service due to maintenance or supply problems (not mission capable maintenance and not mission capable supply) for 16 major Army systems, (2) average equipment age for 15 major Army systems, and (3) depot maintenance requirements for 10 systems.

<sup>4</sup>The Army's reportable equipment items are identified in Army Regulation 700-138, app. B.

<sup>5</sup>See Army Regulation 220-1, Sept. 1, 1997, para. 6.5.

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## Most Active Duty Army Units Have Their Major Equipment but Lack Essential Support Equipment

A review of Unit Status Report data for September 1998 showed that a large percentage of active duty Army units had their principal weapon systems and major equipment items.<sup>6</sup> Status levels for this equipment have increased notably over the past few years. However, many units do not have all the auxiliary equipment needed to support their major equipment and provide mission sustainment support. Army officials believe shortages can be made up before deployment but acknowledge that in two nearly simultaneous conflicts some later deploying units may have to deploy without all of their authorized auxiliary equipment. Units without all authorized auxiliary equipment would still be able to perform their basic mission, but they may suffer limitations in their capability, flexibility, and sustainability.

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## Units Have Their Principal Weapon Systems and Major Equipment Items

We reviewed the equipment on-hand status of 1,483 active duty units as reported in September 1998 and found that most units reported either an S-1 or S-2 status for on-hand equipment. A unit reporting an S-1 status has the equipment needed to accomplish all missions for which it was designed with no additional resources. S-2 units have the equipment needed to undertake most of the full mission for which they were designed but may experience isolated decreases in flexibility for mission accomplishment. These units will require little, if any, assistance to compensate for deficiencies. S-3 units will require significant equipment to compensate for deficiencies but can undertake many portions, but not all, of the full mission for which they were designed. S-4 units need significant additional equipment to accomplish their assigned wartime mission.

Data for the past 7 years also show that equipment on-hand status levels have increased notably in active duty units for this time period. Since 1992 the number of units reporting equipment on-hand status levels below S-2 has decreased significantly. This seems logical given the downsizing of the force from 18 divisions to 10 divisions and the flow of excess equipment to remaining units. Under the Army's first to fight, first equipped strategy, priority for equipment available from downsizing would generally go to units scheduled to deploy early in a conflict.

We did not identify any aggregate Army data systems that would allow us to corroborate the reliability of equipment on-hand data in unit status reports.

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<sup>6</sup>Precise numbers are classified.

However, we reviewed and compared unit property records at three brigade-sized commands in the continental United States to the equipment on-hand data in their Units' Status Reports.<sup>7</sup> We found that the property book records generally supported the reported equipment on-hand status.

### Units Do Not Have All Their Required Auxiliary Equipment

Our analysis of Unit Status Report data for September 1998 showed a large percentage of active duty units had significant shortages of auxiliary equipment. Some of the significant auxiliary equipment shortages are identified in table 1. Applying the Army's equipment on-hand criteria to auxiliary equipment, over 62 percent of the units reporting auxiliary equipment would have an S-3 or S-4 status.

**Table 1: Examples of Auxiliary Equipment Shortages in U.S. Forces Command Units**

Item	Units reporting shortages	Number of items short
Telephone cable	335	6,481
Night vision goggles	214	8,835
Binoculars	174	1,129
Generator set	148	493
Global positioning system	136	1,246
Chemical agent monitor	114	521
Battery charger	38	112

Note: Shortage computations include substitute items.

Source: U.S. Forces Command (FORSCOM), June 1999.

Officials from the Office of the Army Deputy Chief of Staff for Logistics said that the shortages exist for a number of reasons, including recent increases in requirements for some items, slowed procurement funding, and units' use of operations and maintenance funds for higher priorities. Many auxiliary equipment items, for example, must be purchased with operations and maintenance funds. Officials said that units tend to delay purchasing items they may not consider critical when their funding is insufficient. This appeared to be the case at the three brigades we visited where items that were purchased with operations and maintenance funds comprised 28 to 53 percent of the missing auxiliary equipment. The high percentage of missing items that must be purchased in this way does not conclusively prove that inadequate funding is the cause. For example, some

<sup>7</sup>The number of units visited was not sufficient to meet the requirements for a statistically valid sample.



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items may not have been available through the supply system. Equipment managers at the Army's Tank and Automotive Command also said that reductions in procurement funding particularly affect auxiliary equipment because funding priority generally goes to principal weapon systems and major equipment.

The Army's Unit Status Report regulation states that a unit commander that lacks equipment, including auxiliary equipment, that he deems combat essential should address the shortages in the narrative remarks section of the report and consider the effect of these shortages, among other factors, in formulating the mission accomplishment estimate.<sup>8</sup> However, our review of the September 1998 Unit Status Reports found that commanders rarely identified impacts related to auxiliary equipment shortages even in cases where our analysis showed significant amounts of equipment were missing. For example, 74 units that we identified as S-4 for auxiliary equipment also reported an overall unit status of C-1 (the unit could perform its full wartime mission). As mentioned previously, units do not identify the specific auxiliary equipment they are missing so we could not question the commanders' subjective assessment.

Shortages of some auxiliary equipment are likely to have little effect on unit operations. For example, sign painting kits and wristwatches are auxiliary equipment that would not likely affect mission accomplishment. Other auxiliary equipment may be needed only in certain operating environments. For example, winterization kits for UH-60 Blackhawk helicopters may not be needed in Southwest Asia, and electrical distribution equipment may not be needed by units moving into large, preestablished bases. Other auxiliary equipment, such as battery chargers, generators, and mine detectors, however, may limit a unit's capability, flexibility, or sustainability.

FORSCOM officials generally discount the effect of auxiliary equipment shortages on mission accomplishment. They report that units with auxiliary equipment shortages would still be able to perform their basic warfighting mission. Additionally, they said they carefully review unit equipment before deployments and make up any equipment shortages deemed necessary for the mission. For example, during Operations Desert Shield/Desert Storm, to rectify shortages, FORSCOM officials said that they extensively transferred equipment between units and bought equipment such as generators, cellular phones, facsimiles, secure telephones, and

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<sup>8</sup> See AR 220-1, Sept. 1, 1997, paras. 5-13c(2), 8-1, and 8-3.



other electronic devices from the commercial market prior to deployment. Although FORSCOM plans to continue this general approach in rectifying shortages, no definitive plans exist specifying how this will take place. Given the magnitude of the shortages, transferring equipment between units may be problematic.

The Army's description of auxiliary equipment as either essential to support principal weapon systems or provide unit sustainment support seems to be contradicted by the large amounts of equipment missing and the absence of any reported effect by Army units.<sup>9</sup> It is understandable that units can and do function without all required equipment items. However, at some point the synergy built into a unit begins to be reduced when large amounts of equipment are missing. Shortages of maintenance equipment, in particular, create questions about a unit's ability to sustain its primary weapon systems at a wartime pace of operations. Given the number of units with shortages, one would expect to see some acknowledgment of a capability, flexibility, or sustainment limitation in at least some units. The absence of any recognized effect demonstrates either that the equipment is not essential or that commanders are not appropriately considering potential limitations to their units. Additionally, in February 1993, we reported on the impact of equipment shortages during the Gulf War mobilization.<sup>10</sup> During that conflict the Army transferred equipment between units to rectify shortages but found that filling shortages became more difficult as the operation progressed and more units were mobilized. As equipment became scarcer, some equipment shortages could not be filled, and as a result, some units were deployed without all of their equipment. Our report stated a number of instances in which units were hampered in their ability to perform their required mission by the equipment shortages.

## Army Data Do Not Provide a Clear Picture of Equipment Condition

Despite the Unit Status Reports for September 1998 that showed that equipment serviceability rates were high, the Army reported in its Quarterly Readiness Report to the Congress for the fourth quarter of fiscal year 1998 its concern that its equipment is aging and becoming increasingly difficult to maintain. Maintenance managers at units we visited also said that their mechanics are working harder to keep equipment operating.

<sup>9</sup>See AR 220-1, Sept. 1, 1997, App. B.

<sup>10</sup>Reserve Forces: Aspects of the Army's Equipping Strategy Hamper Reserve Readiness (GAO/NSIAD-93-11, Feb. 18, 1993).

However, these problems are not reflected in high equipment readiness rates. We have previously reported that serviceability rates do not provide a good assessment of equipment condition because equipment that is old, unreliable, and difficult to maintain may be reported serviceable.<sup>11</sup> However, we could not determine the extent to which Army units are affected by equipment problems because the Army does not have data that identifies either its unreliable equipment or how units are affected.

### Serviceability Data Show Units Are Maintaining Equipment

In addition to showing quantities on hand, the Unit Status Reports measure equipment readiness by how well units maintain their on-hand reportable equipment. The Army's goal is that 90 percent or more of ground equipment be in a fully mission capable status, which means the equipment can perform all of its combat missions without endangering the lives of crew or operators.<sup>12</sup> Aircraft units have a goal of 75 percent or higher fully mission capable. Unit Status Report data for September 1998 showed that the majority of the 1,483 active duty Army units reporting were achieving the Army's goals.<sup>13</sup> According to commanders at the units we visited, meeting the Army's serviceability goals is a command priority and the condition of pacing items and other reportable equipment is closely monitored at all command levels.

Historical Unit Status Report data also show that units have generally maintained their major equipment at the fully mission capable goals over time. For example, table 2 shows the quarterly mission capable rates for 16 major Army equipment items that were being maintained at 90- and 75-percent rates from October 1994 through August 1998. Mission capable rates for some equipment occasionally fell below the goals. However, we see no pattern that would suggest an increasing problem.

<sup>11</sup>Military Readiness: DOD Needs to Develop a More Comprehensive Measurement System (GAO/NSIAD-95-29, Oct. 27, 1994).

<sup>12</sup> See AR 220-1, Sept. 1, 1997, Glossary, Section II, Terms; and AR 700-138, Sept. 16, 1997, para. 1-6.

<sup>13</sup>Precise numbers are classified.

Table 2: Mission Capable Rates for 16 Major Equipment Items

Equipment item	Oct. 1994	Mar. 1995	Oct. 1995	Mar. 1996	Oct. 1996	Mar. 1997	Oct. 1997	Mar. 1998	Aug. 1998
<b>Aircraft systems: Availability goal 75 percent</b>									
CH-47D Chinook cargo helicopter	75	78	74	75	76	73	77	73	75
AH-64 Apache attack helicopter	78	82	83	80	82	84	86	83	81
OH-58D Kiowa Warrior helicopter	83	76	79	84	82	85	87	87	87
UH-60 Blackhawk helicopter	78	73	78	78	81	81	82	85	79
<b>Ground systems: Availability goal 90 percent</b>									
M1A1 Abrams tank	N/A	N/A	N/A	93	92	92	92	93	90
M1A2 Abrams tank	N/A	N/A	0	28	84	95	84	90	92
M2 Bradley Fighting Vehicle	91	94	94	95	95	95	94	95	92
M3 Armored Cavalry scout vehicle	91	93	93	94	92	91	93	91	94
M109 Self-propelled howitzer	95	95	95	96	96	96	97	96	97
M198 Towed howitzer	95	95	90	93	94	94	91	94	93
HEMTT [Heavy expanded mobility tactical truck]	89	89	90	88	89	89	90	89	88
HMMWV [High mobility multipurpose wheeled vehicle]	94	94	95	94	95	94	95	94	93
MLRS [Multiple launch rocket system]	94	93	94	94	95	96	95	94	95
TOW2 HMMW [High mobility multipurpose wheeled vehicle]	97	97	97	98	96	96	97	96	98
Patriot missile system	97	97	96	95	96	92	94	95	92
Avenger ground to air missile system	N/A	99	98	99	96	98	98	97	98

Source: Quarterly Readiness Report to the Congress, 4<sup>th</sup> quarter, fiscal year 1998.

### Serviceability Data Do Not Provide a Good Assessment of Equipment Condition

Although overall serviceability rates are high as shown in table 2, serviceability data do not provide a complete assessment of equipment condition. Our 1994 report on the ability of DOD's readiness reporting system to provide a comprehensive assessment of overall readiness stated that C-ratings represent a snapshot of readiness in time but by design do not address long-term readiness or signal impending changes in the status

of resources and for equipment, this continues to be the case. Specifically, equipment that is old, unreliable, and difficult to maintain may be reported serviceable. For example, Army officials told us that the Armored Vehicle Launched Bridge and the Armored Combat Earthmover are examples of systems that are complex, difficult to maintain, and/or aging in the Army inventory. The Army is in the process of replacing the Armored Vehicle Launched Bridge with the Wolverine Heavy Assault Bridge. Despite these problems, serviceability rates for these systems generally are in the 86- to 92-percent range. While the Army's goal is for units to maintain ground equipment above 90-percent availability, slight decreases below this goal do not by themselves indicate problems. For example, as shown in table 2, the M1A2 Abrams tank's rates were below the goal during four quarters, even though the Abrams is among the Army's newest and most modern weapons. Maintenance managers told us that they can maintain high serviceability rates, even for problem equipment, through intense investments of time. However, the effort required to keep equipment serviceable is not reflected in readiness reports.

### Other Army Equipment Condition Indicators Do Not Support Reliability or Maintenance Problems

Our review of other Army equipment condition indicators, including the expanded equipment condition indicators recently provided in DOD's Quarterly Readiness Report to the Congress, revealed that the indicators do not effectively identify and highlight the Army's equipment problems. To the contrary, most of the indicators show few equipment problems.

The Army maintains that its equipment is becoming increasingly difficult to maintain. If units are experiencing problems with unreliable equipment, the problems should be reflected in increasing amounts of equipment reported as "not mission capable-maintenance." "Not mission capable-maintenance" is reported when equipment cannot perform its mission because of maintenance underway or needed. Units report equipment out of service for maintenance through the Unit Level Logistics System, and the Army aggregates and stores this data at the Army Materiel Command's Logistics Support Activity (LOGSA).

As shown in table 3, Army data from October 1994 through August 1998 for 16 key Army systems show no increase in the percent of equipment not mission capable and no downward trends that would indicate worsening conditions. Officials at the units we visited explained that the data might not be a good indicator of reliability problems because available personnel work not only their regular schedules but also evenings and weekends to keep maintenance backlogs low. However, the Army does not collect workload data for individual equipment systems that would illustrate increasing workloads.

**Table 3: Percent of Equipment Not Mission Capable Maintenance**

Equipment item	Oct. 1994	Mar. 1995	Oct. 1995	Mar. 1996	Oct. 1996	Mar. 1997	Oct. 1997	Mar. 1998	Aug. 1998
CH-47D Chinook cargo helicopter	22	19	23	21	21	24	20	23	23
AH-64D Apache attack helicopter	17	14	14	13	14	13	12	13	16
OH-58D Kiowa warrior helicopter	11	15	13	14	16	12	11	11	11
UH-60D Blackhawk helicopter	16	22	18	18	15	15	15	12	19
M1A1 Abrams tank	N/A	N/A	N/A	1	2	3	1	2	4
M1A2 Abrams tank	N/A	N/A	50	70	8	3	8	5	4
M2 Bradley Fighting Vehicle	3	1	1	1	1	1	1	1	3
M3 Armored Cavalry scout vehicle	3	2	2	1	1	1	1	4	2
M109 Self-propelled howitzer	2	1	1	2	1	1	1	1	0
M198 Towed howitzer	2	3	7	2	3	3	2	4	5
HEMTT	4	3	3	4	3	4	3	5	6
HMMWV	2	2	2	2	2	2	1	3	4
MLRS	3	4	2	3	3	2	2	3	3
TOW2 HMMWV	1	1	1	1	2	1	2	2	1
Patriot missile system	3	2	2	4	2	2	2	3	3
Avenger ground to air missile system	N/A	0	1	1	2	0	1	1	0

Source: Quarterly Readiness Report to the Congress, 4<sup>th</sup> quarter, fiscal year 1998.

We also analyzed data in the Army Cost and Economic Analysis Center's Operating and Support Management Information System (OSMIS) for indications of equipment reliability problems. The OSMIS database is the Army's source of historical operating and support cost information for more than 350 systems that are in tactical units—Active, Guard, and Reserve. Generally, increasing operating and support costs should be an indicator of growing reliability problems. However, our analysis of operating and support cost data shows few problems with increasing operating and support costs. For example, we compared fiscal year 1992 repair parts costs (consumables and net reparable) per hour flown or mile driven for 20 active duty aviation, tactical wheeled vehicle, artillery and missile, and combat systems (tanks and infantry fighting vehicles) to the fiscal year 1996 repair parts costs. We found that costs decreased for

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15 systems (75 percent), increased for 4 systems (20 percent), and remained stable for 1 system (5 percent). A comparison of fiscal year 1993 and 1996 repair parts costs for the same 20 systems similarly showed that 14 systems (70 percent) had lower repair parts costs while 6 (30 percent) had higher. We also compared annual repair parts costs for another 9 systems where usage data were not available, such as communications and engineering equipment, and artillery systems. Without usage data, annual repair parts costs are a less precise measure of reliability but generally show how much the equipment is being repaired. Repair parts costs decreased between fiscal year 1992 and 1996 for seven systems and increased for two. A comparison of fiscal year 1993 and 1996 repair parts costs for the same nine systems showed that five systems had lower repair parts costs while four had higher.

Army officials told us that OSMIS data might not support possible reliability problems because there is not a direct correlation between equipment operation and repair parts usage. However, they agree that if equipment is being repaired more frequently, it should be indicated by the data. They speculated that repairs might be down because some equipment is being used less.

Our analysis of historical data from October 1994 through August 1998 for the Army's top 16 systems shows some variance in equipment out of service while awaiting repair parts, but overall the data does not indicate increasing problems in repair parts availability.

**Table 4: Percent of Equipment Not Mission Capable Supply**

Equipment item	Oct. 1994	Mar. 1995	Oct. 1995	Mar. 1996	Oct. 1996	Mar. 1997	Oct. 1997	Mar. 1998	Aug. 1998
CH-47D Chinook cargo helicopter	3	3	3	4	3	3	3	4	2
AH-64D Apache attack helicopter	5	4	3	7	4	3	2	4	3
OH-58D Kiowa Warrior helicopter	6	9	8	2	2	3	2	2	2
UH-60D Blackhawk helicopter	6	5	4	4	4	4	3	3	2
M1A1 Abrams tank	N/A	N/A	N/A	6	6	5	7	5	6
M1A2 Abrams tank	N/A	N/A	50	2	8	2	8	5	4
M2 Bradley Fighting Vehicle	6	5	5	4	4	4	5	4	5
M3 Armored Cavalry scout vehicle	6	5	5	5	7	8	6	5	4
M109 Self-propelled howitzer	3	4	4	2	3	3	2	3	3
M198 Towed howitzer	3	2	3	5	3	3	7	2	2
HEMTT	7	8	7	8	8	7	7	6	6
HMMWV	4	4	3	4	3	4	4	3	3
MLRS	3	3	4	3	2	2	3	3	2
TOW2 HMMWV	2	2	2	1	2	3	1	2	1
Patriot missile system	0	1	2	1	2	6	4	2	5
Avenger ground to air missile system	N/A	1	1	0	2	2	1	2	2

Source: Quarterly Readiness Report to the Congress, 4<sup>th</sup> quarter, fiscal year 1998.

Maintenance officers at two units we visited told us that they had not experienced problems with the availability of repair parts. However, at the 7<sup>th</sup> Transportation Group maintenance officers reported difficulties obtaining parts for some older ships in their fleet. The 7<sup>th</sup> Transportation Group has several boat companies that transport cargo, troops, and vehicles between ship and shore, or from one port to another port. Additionally, although units were reducing the number of repair parts in their inventories, unit supply managers' told us they were not having any more difficulty obtaining spare parts than in the past. Nonetheless, units visited reported that they occasionally obtained parts by removing them from other equipment items rather than waiting for the supply system to provide them. A FORSCOM official, however, told us that he believes that the practice of "controlled substitution" has not increased notably.



We also analyzed equipment age because keeping equipment past its useful life may lead to unacceptable operating and support costs and a decrease in wartime operational effectiveness. As shown in table 5, the equipment ages for 15 major systems reported in the expanded Quarterly Readiness Report to the Congress shows that most major systems are within their estimated service life.

**Table 5: Average Age of the Army's Top 15 Systems**

Equipment item	Estimated service life	Average age
M1A1 Abrams tank	20	9.3
M1A2 Abrams tank	20	1.5
M2/M3 Bradley Fighting Vehicle	20	11.2
M109 Self-propelled howitzer	N/A	6
M198 Towed howitzer	N/A	12
MLRS	N/A	9.2
Patriot missile system	N/A	10.5
Avenger ground-to-air missile system	N/A	8.7
HEMTT	20 years	11.5
HMMWV	14 years	8.1
TOW2 HMMWV	14 years	11.8
AH-64 Apache attack helicopter	20	11.2
OH-58D Kiowa Warrior helicopter	20	8.2
CH-47D Chinook cargo helicopter	20	10.8
UH-60 Blackhawk helicopter	20	11.6

Sources: Estimated service life data were obtained from FORSCOM and Army Materiel Command officials. Average age data were obtained from the Quarterly Readiness Report to the Congress, 4<sup>th</sup> quarter, fiscal year 1998. N/A indicates data were not available.

Another indicator of aging equipment is the Army's equipment recapitalization program that extends the service life of equipment through depot rebuild or technology insertion. Extending the service life of equipment is sometimes necessary when production and fielding rates for new equipment are insufficient to prevent fleet aging from becoming a chronic problem. Some of the recapitalization programs we identified that address problems with aging equipment include engineer support equipment, construction equipment, Paladin M109 Howitzer, UH-60A Blackhawk helicopter, UH-1 Iroquois utility helicopter, HEMTT, HMMWV, 2 1/2-ton truck, 5-ton truck, line-haul tractors, engineer tractors, and materiel handling equipment.

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Army officials acknowledge that serviceability rates and other condition indicators currently reported provide a limited picture of equipment condition. However, identifying predictive condition indicators for the large variety of equipment in the Army is complex. They said that Army commands independently monitor numerous additional information sources to supplement data reported in Unit Status Reports. These sources include reports from Logistics Assistance Offices at all installations and item managers at the commodity commands. This information is generally not reported to higher commands. They report that this information is sufficient to provide assurance on current readiness issues but acknowledge its weakness for identifying longer term equipment condition problems.

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## **The Army May Experience Problems Sustaining Its Equipment**

The Army may have difficulty sustaining its equipment in the event of two nearly simultaneous military operations, the most demanding scenario, because of significant shortages of maintenance personnel and war reserve repair parts stocks. The war reserve repair parts stocks are intended to support Army units during wartime until logistics supply lines can be established from the United States. The amount of repair parts that should be stocked is based on the Army's most demanding scenario, two nearly simultaneous theater wars, and considers repair part utilization rates for major equipment items, on-hand general issue stocks, on-hand war reserve stocks, and the amounts industry can provide.

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## **Units Are Short Some Maintenance Skills**

Unit commanders we visited reported the availability of maintenance personnel with the right skills and tenure was the units' most significant equipment readiness problem. Army-wide shortages of personnel, frequent deployments to peacekeeping missions, and the assignment of personnel to tasks outside their military specialty were the primary reasons cited. These shortages create risks in the Army's ability to sustain its equipment in the event of two nearly simultaneous theater wars.

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The units we visited had 97 to 99 percent of their authorized enlisted personnel at the time of our visits. However, high unit manning rates do not fully reflect the extent of maintenance personnel shortages in the units or the impact of these shortages on the units' ability to accomplish critical wartime tasks. Further, high manning rates do not capture the rank (enlisted versus noncommissioned officers), skill, and experience imbalances that affect their maintenance operations. FORSCOM data shown in table 6 show that these imbalances are prevalent.

Table 6: Personnel authorized and assigned by grade for a sample of occupations

Military occupational specialty	Enlisted (E-1 through E-4) (auth/assigned)	Noncommissioned officers (E-5 through E6) (auth/assigned)	Senior noncommissioned officers (E-7 through E-9) (auth/assigned)
44B Metal worker	361/386 107%	112/93 83%	Not applicable
44E Machinist	105/96 91%	104/87 84%	3/2 67%
45B Small arms/artillery repairman	213/206 97%	47/37 79%	Not applicable
45D Self-propelled field artillery turret mechanic	49/80 163%	62/21 34%	Not applicable
45E Abrams tank turret mechanic	264/330 125%	85/68 80%	Not applicable
45K Armament repairman	297/227 76%	192/158 83%	67/61 91%
45T Bradley Fighting Vehicle system turret mechanic	142/262 185%	113/58 51%	Not applicable
52C Utilities equipment repairman	533/474 89%	229/226 99%	Not applicable
52D Power generation equipment repairman	1389/1208 87%	505/471 93%	Not applicable
62B Construction equipment repairman	651/635 98%	398/351 88%	81/98 121%
63B Light wheel vehicle repairman	3234/2844 88%	1867/1748 94%	593/521 88%
63D Self-propelled field artillery system mechanic	224/177 79%	145/149 103%	50/47 94%
63E M1 Abrams tank system mechanic	390/580 149%	381/251 66%	136/140 103%
63G Fuel/electrical system repairman	191/198 104%	45/48 107%	Not applicable
63H Tracked vehicle repairman	666/764 115%	643/475 74%	474/464 98%
63S Heavy wheel vehicle mechanic	1189/1003 84%	398/369 93%	Not applicable
63T Bradley Fighting Vehicle system mechanic	980/1161 119%	616/439 71%	127/134 106%
63W Wheel Vehicle repairman	1582/1488 94%	361/364 101%	Not applicable
63Y Track vehicle mechanic	269/277 103%	127/105 83%	Not applicable

Source: FORSCOM, February 1999.

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Commanders of units visited reported similar personnel shortages. Some of the significant shortages reported follow.

- At the 3<sup>rd</sup> Brigade of the 2<sup>nd</sup> Infantry Division, only 2 of 8 Bradley Fighting Vehicle turret mechanics (25 percent), and 5 of 10 Abrams tank systems mechanics (50 percent) were assigned. The brigade also had only 28 of 44 motor transport operators (64 percent) assigned.
- At the 7<sup>th</sup> Transportation Group, only 10 of 15 light wheel vehicle supervisors (67 percent) were assigned. The group also had only 20 of 30 authorized motor transport operators (67 percent).
- At the 18<sup>th</sup> Aviation Brigade, 17 of 25 authorized light wheel vehicle mechanics (68 percent) were assigned. A CH-47 Chinook helicopter company within the brigade had 37 helicopter repairman assigned of 38 authorized but, according to unit officials, 8 repairman could not work because of medical problems. The company also had all three authorized aircraft powertrain repairmen, but we were told that all three were fresh from school and lacked experience.

Army officials told us of several other issues that compound their personnel shortage problems. First, over the past few years the amount of training provided in Army schools had been reduced and units are expected to provide more of the skills-oriented training. Additionally, many occupational specialties have been combined and individual soldiers are responsible for knowing how to repair more types of equipment than previously. These changes have significantly increased the supervisory and training workload for unit noncommissioned officers. Second, the burden of peacekeeping operations, along with the assignment of personnel to tasks outside their military specialties, has also added to noncommissioned officers' workloads. For example, the 7<sup>th</sup> Transportation Group provided one battalion per month to the post for base support activities. Army officers told us that reductions in base operating support funding left them with no choice but to use soldiers for these tasks. The result, however, has been that the maintenance workload tends to focus on a few key individuals who must work long and hard to maintain unit equipment readiness status. Readiness reporting does not capture this increase in work tempo.

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### Prepositioned War Reserve Repair Parts May Limit Equipment Sustainability

Sustaining Army equipment in two nearly simultaneous major theater wars may also present risks due to shortages of war reserve repair parts. According to a contractor study, the operational availability of many of the Army's major weapon systems will decrease significantly by the 60th day of an overlapping two-theater war because of a repair part shortage. For

example, the operational availability of the AH-64 Apache is forecast to fall to 44 percent by day 60 of a conflict and the operational availability of the OH-58D Kiowa is forecast to fall to 52 percent. Conflicts requiring fewer forces than assumed in the study would result in higher operational availabilities. Army officials report they have started efforts to fund critical shortages. Table 7 shows the Army's estimated equipment availability in a two-war scenario.

**Table 7: Availability of Selected Equipment in a Two-War Scenario; 30 Days between Wars**

Numbers in percent

Availability of selected equipment	Two major theater wars (30 day periods)				
	30	60	90	120	150
Abrams tank	89	83	61	49	46
AH-64 Apache	56	44	37	31	26
Avenger	84	82	64	46	39
Bradley Fighting Vehicle	76	79	53	44	41
CH-47 Chinook	70	64	57	50	45
Heavy equipment transporter	75	54	41	33	29
HMMWV	82	83	61	60	58
HEMTT	84	80	77	58	51
Howitzer	69	52	31	26	24
M113	86	84	66	50	44
MLRS	87	75	40	26	20
Mobile subscriber equipment	72	34	35	33	32
OH-58D, Kiowa	65	52	35	25	22
Palletized load system	81	71	45	36	34
SinCgars	89	71	65	52	46
UH-60 Blackhawk helicopter	65	62	57	53	52

Source: Army War Reserve Secondary Items, Final Report – Phase II, Coopers & Lybrand, June 1998.

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## Conclusions

The Army's current equipment readiness indicators provide valuable information, but they do not provide a comprehensive assessment of equipment. In particular, the equipment on-hand indicator does not effectively characterize unit conditions as they relate to capability, flexibility, and sustainment. Shortages of some auxiliary equipment may have little impact on units, while others, such as camouflage nets, night vision goggles, and communications equipment, give Army forces a combat edge over their possible foes. Current guidance does not emphasize the need to assess how auxiliary equipment shortages may affect their wartime operations. Over 60 percent of reporting units had significant shortages of auxiliary equipment that would likely continue in the early stages of a deployment.

The Army's equipment condition indicators similarly do not support or refute the Army's position that its equipment is aging and becoming increasingly difficult to maintain. Army units' equipment serviceability status remains high and stable, and other indicators recently provided by the Army in its Quarterly Readiness Report to the Congress similarly show few equipment problems. The amount of time that equipment is not mission capable because of maintenance or supply problems remains low and stable, seemingly refuting assertions that equipment is becoming less reliable or is plagued by supply problems. Further, age data on major systems indicate that most equipment is within its estimated service life. This disparity illustrates the limitation of the Army's equipment condition assessment.

Finding the right set of equipment condition indicators is complex. Given the large variety of equipment items in the Army's inventory, no one common set of indicators is likely to provide a comprehensive assessment of equipment condition for all items. Further, expanding the number of equipment items that the Army provides information on threatens to be burdensome with no assurance that problem systems will be reflected. The best alternative may be a report that specifically identifies equipment problems, details the readiness impact, and proposes solutions. This would enable the Army to succinctly focus on its equipment problems so they can be addressed by Army, DOD, and the Congress and provide assurance that it knows the true status of its equipment.

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## Recommendations

We recommend that the Secretary of the Army direct the Deputy Chief of Staff for Plans and Operations to reemphasize to Army commanders the



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requirement to identify the operational impact of essential auxiliary equipment shortages in the narrative remarks section of the Unit Status Report and to properly consider shortages of auxiliary equipment when formulating their mission accomplishment estimates. The Deputy Chief of Staff for Plans and Operations should instruct commanders to focus more broadly on unit capability, flexibility, and sustainability issues in formulating their overall unit status and mission accomplishment estimate.

To improve equipment condition reporting, we recommend that the Secretary of the Army direct the Deputy Chief of Staff for Logistics to submit a periodic report to the Congress that highlights the Army's top equipment problems. This report should address more than just the 16 reportable SORTS systems and should identify major equipment readiness concerns and planned corrective actions.

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## Agency Comments and Our Evaluation

DOD provided written comments on a draft of this report and they are included in their entirety in appendix II. DOD concurred with our recommendation that the Secretary of the Army should reemphasize to Army commanders the requirement to identify the operational impact of auxiliary equipment shortages. DOD also concurred with our recommendation that the Army periodically report to the Congress on their top equipment problems. We used the term periodically to give the Army the discretion to report as often as it believed necessary to keep the Congress informed. However, it was our intention that a report be submitted at least annually. Additionally, in its response to this recommendation DOD stated that it believes a report is an appropriate process to highlight auxiliary equipment problems. We did not intend this report to be limited to auxiliary equipment problems.

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## Scope and Methodology

To determine if units have the equipment necessary to conduct their wartime missions, we obtained summary-level information on the Army's equipment on-hand posture as of September 1998 from DOD's SORTS. We also obtained equipment on-hand data for three brigade sized units and visited those units to determine if the SORTS data accurately reflected actual unit conditions by reviewing and comparing unit property book records to the reported SORTS data. These units were the 7<sup>th</sup> Transportation Group, Fort Eustis, Virginia; 3<sup>rd</sup> Brigade, 2<sup>nd</sup> Infantry Division, Fort Lewis, Washington; and, 18<sup>th</sup> Aviation Brigade, Fort Bragg, North Carolina. We also used SORTS data to calculate the equipment on-

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hand status for lower priority equipment for all reporting active duty units as of September 1998. We then discussed our findings with Army officials in the Offices of the Deputy Chief of Staff for Logistics, Deputy Chief of Staff for Operations and Plans, and FORSCOM.

To determine the condition of the Army's equipment, we analyzed summary equipment serviceability data for all reporting active duty Army units as of September 1998 and equipment serviceability data for three brigade-sized units from SORTS. These units were the same units discussed above. We then visited those units to inspect the equipment and maintenance records to determine if the SORTS data accurately reflected actual field conditions. At the units we met with unit commanders, maintenance supervisors, and maintainers to discuss problems they may have in supporting the equipment. We also met with personnel responsible for maintaining the units' inventories of repair parts. At Fort Eustis, we met with the Directorate for Logistics, who was responsible for providing the 7<sup>th</sup> Transportation Group's direct support maintenance. At Fort Lewis, we met with I Corps officials, and at Fort Bragg we met with 1<sup>st</sup> Corps Support Command officials responsible for supporting their respective brigades' equipment to discuss equipment conditions and support problems.

To gather information on Army-wide equipment conditions, we met with officials from LOGSA at Redstone Arsenal, Alabama, who provided data on readiness trends for reportable equipment and age data for Army equipment. Officials from the U.S. Army Cost and Economic Analysis Center, Falls Church, Virginia, discussed how they track operating and support costs for Army equipment with us and provided us data for 350 Army systems. Officials from the Army Materiel Support Analysis Activity, Aberdeen Proving Grounds, Maryland, discussed their ongoing effort to gather mean utilization between failure data for Army equipment. We also met with officials from the U.S. Army's Tank and Automotive Command, Warren, Michigan, to discuss information they possess on equipment condition. After analyzing the data, we discussed our conclusions with officials from the Offices of the Army Deputy Chief of Staff for Logistics, Army Deputy Chief of Staff for Operations and Plans, DOD Under Secretary of Defense for Personnel and Readiness, and FORSCOM.

Our information on equipment sustainment was derived from interviews with unit commanders at the three bases visited as well as data on specific maintenance skill shortages in the respective units. We followed up on the data with FORSCOM officials. We obtained our information on repair parts

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war reserves from the Office of the Deputy Chief of Staff for Logistics and the U.S. Army Materiel Support Analysis Activity. We conducted our review from June 1998 to February 1999 in accordance with generally accepted government auditing standards.

We are sending copies of this report to other interested committees. We are also sending copies of this report to the Honorable William Cohen, Secretary of Defense and the Honorable Louis Caldera, Secretary of the Army. Copies will also be made available to others upon request.

Please contact me at (202) 512-5140 should you or your staff have any questions concerning this report. Major contributors to this report are listed in appendix II.

Sincerely yours,

A handwritten signature in black ink, reading "Mark E. Gebicke". The signature is written in a cursive, flowing style.

Mark E. Gebicke  
Director, National Security and Preparedness



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## Abbreviations

DOD	Department of Defense
FORSCOM	U.S. Forces Command
LOGSA	Logistics Support Activity
OSMIS	Operating and Support Management Information System
SORTS	Status of Resources and Training System
SORTS	Status of Resources and Training System



# Comments From the Department of Defense



PERSONNEL AND  
READINESS

OFFICE OF THE UNDER SECRETARY OF DEFENSE  
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MAY 19 1999

Mr. Mark E. Gebicke  
Director, Military Operations and Capabilities Issues  
National Security and International Affairs Division  
U.S. General Accounting Office  
Washington, D.C. 20548

Dear Mr. Gebicke:

This is the Department of Defense (DoD) response to the General Accounting Office (GAO) draft report, "MILITARY READINESS: Readiness Reports Do Not Provide a Clear Assessment of Army Equipment," dated March 30, 1999 (GAO Code 703238/OSD Case 1780).

We have reviewed the draft report and agree with your proposed recommendations. We would note that the Army has and will continue to improve their current equipment readiness indicators. They have also taken positive steps to address their sustainment stock shortfalls through the Army's single stock fund initiative and planned increases in critical war reserve funding. Our comments on your draft recommendations are as follows:

Recommendation One: The GAO recommended that the Secretary of the Army direct the Deputy Chief of Staff for Plans and Operations (DCSOPS) to reemphasize to Army Commanders the requirement to identify the operational impact of essential auxiliary equipment shortages in the narrative remarks section of the Unit Status Report, and to properly consider shortages of auxiliary equipment when formulating their mission accomplishment estimates. The DCSOPS should instruct commanders to focus more broadly on unit capability, flexibility, and sustainability issues in formulating their overall unit status and mission accomplishment estimate.

DoD Response: Concur. Although Army Commanders are required to report the status of essential auxiliary shortages in their readiness reports, an instruction from the Army DCSOPS should serve to remind all involved of the importance of accurately reporting on the status of these assets.

Recommendation Two: The GAO recommend that the Secretary of the Army direct the Deputy Chief of Staff for Logistics (DCSLOG) to develop a periodic report to the Congress that highlights their top equipment problems. This report should be broader in its scope than just the 16 reportable SORTS systems and address their major equipment readiness concerns and planned corrective actions.





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Appendix I  
Comments From the Department of Defense

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DoD Response: Concur. We believe an exception report is an appropriate process to highlight any auxiliary equipment problems to the senior DoD leadership and the Congress. This exception report will be incorporated in our on-going efforts to improve DoD's readiness reporting system. We will continue to monitor and support the Army's effort to improve its equipment reporting and ensure this information is captured in our readiness assessment process.

We appreciate the opportunity to comment on the draft report.

Sincerely,



Joseph J. Angello, Jr.  
Director,  
Readiness Programming & Assessment

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# Major Contributors to This Report

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